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March 17, 1995

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Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

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Re: In the Matter of Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services WT Docket No. 94-148.

Dear Mr. Caton:

Enclosed herewith is one (1) original, and 5 (five) copies of our reply to the comments submitted to the Notice of Proposed Rulemaking in WT Docket 94-148.

Sincerely,

COMSEARCH


Christopher R. Hardy
Director
Microwave and Satellite Services
Enclosure

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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OFFICE OF SECRETARY

In the matter of

Reorganization and Revision of)
Parts 1,2,21, and 94 of)
the Rules to Establish a New)
Part 101 Governing Terrestrial)
Microwave Fixed Radio Services)

WT Docket No. 94-148

DOCKET FILE COPY ORIGINAL

To: The Commission

REPLY COMMENTS OF COMSEARCH

Comsearch, hereby respectfully replies to the comments submitted in response to the Notice of Proposed Rulemaking ("NPRM") in the above captioned proceeding.

It appears from the comments submitted that general support exists for the proposals set forth in the NPRM. Unquestionably, the Commission's proposal to consolidate Rule Parts 21 and 94 through simplification and removal of redundant and obsolete language would serve the public interest. While agreeing with the Commission's key objectives as outlined in the NPRM, most commenters either proposed or supported further consolidation and simplification of the Rules to accomplish these objectives. These proposals included, among others: the consolidation of all technical rules into a single Subpart; Part 21 frequency coordination procedures in all bands; the use of a single application form; electronic filing of applications; and equal treatment of private (OF) and common carrier (CC) services regarding pre-licensing construction, the construction period, and temporary authorizations.

ATPC

Several commenters expressed opinions on ATPC that differ from our initial comments, the TIA/NSMA comments, and TIA Bulletin 10-F.¹ The primary area of concern is how ATPC systems will be coordinated. RCCMC, TSGI, and UTC advocate using the maximum transmitter power to calculate interference from an ATPC system into foreign systems. Pacific Bell wants a simplified procedure where any ATPC system can use a power up to 10 dB below maximum to calculate this interference, regardless of how active the ATPC may be. The TSB 10-F procedure, which allows up to a 10 dB coordination advantage but requires some justification for claiming it, represents a middle ground between these points of view. More importantly, we believe that the concerns expressed by the commenters about coordinating ATPC are properly addressed by the TSB 10-F procedures.

RCCMC and TSGI are concerned that harmful interference may occur if ATPC systems are coordinated at a power below maximum. RCCMC states that it "is concerned that severe cases of interference and service interruption may occur during deep fades when one transmitter powers up and others do not" and that ATPC power increases could "create a chain reaction" of "unnecessary increases

¹ RCCMC at 8 and 9; UTC at 17; TSGI at 8; and Pacific Bell at 1, 2, and 3.

in output power". RCCMC also fears that "a transmitter could operate at its maximum power for long periods of time". Similarly, TSGI is concerned that power increases on ATPC systems could result in "interference levels [causing] existing systems to degrade below acceptable levels". Comsearch believes that the TSB 10-F guidelines will preclude the feared interference problems.

First, the text of 10-F makes the point that fading is strongly uncorrelated among paths and that microwave paths have large fade margins. A short term 10 dB increase in interference power is insignificant in almost all cases since the likelihood of the victim path also being in a deep fade at that time is very small. Everyone benefits from ATPC because transmitters operate at a lower power almost all the time. Under fading conditions, ATPC paths "borrow" fade margin from other area paths that almost certainly don't need it at that instant anyway. Second, the 10-F guidelines require that ATPC systems should be equipped with an alarm that returns the transmitter to nominal power after 5 minutes at maximum power. Also, those claiming a coordination advantage from ATPC are required to provide path calculations showing that the path design will limit the ATPC operation to a small percentage of time annually. These requirements eliminate the possibility of ATPC power increases for long periods of time. Third, TSB 10-F requires that a system has to detect a deep power fade before increasing transmitter power. Therefore, an increase in interference from other systems cannot cause an ATPC system to increase its power.

The scenario of a chain reaction of ATPC power increases is impossible, and all ATPC power increases may be considered necessary since they are caused by deep fading.

With regard to Pacific Bell's comments, we believe that the path calculations required in 10-F to justify a coordination advantage for ATPC are proper. Pacific Bell states that 10-F uses "simplified equations" that don't include important variables to calculate path reliability. However, TSB 10-F fully incorporates the industry standard Vigants reliability model with all its variables. Pacific Bell's confusion may stem from the fact that average path conditions were used in the 10-F example calculations for the sake of simplicity. For coordination, the actual path average temperature, climate factors, and terrain roughness are to be used.

Like Comsearch and most parties that have been involved in frequency coordination in the common carrier bands over the last several years, Pacific Bell is fully comfortable with ATPC and believes that a coordination advantage of up to 10 dB is appropriate in almost all cases. However, we believe that the safeguards included in 10-F are necessary to satisfy the concerns of other parties who share the viewpoint of RCCMC, TSGI, and UTC. The 10-F requirements are rather easily met by reasonable ATPC designs and provide other users confidence that harmful interference will not occur. In addition, 10-F provides necessary

limits such as the 5 minute time at maximum power and the requirement that power increases should be based on power fading. While today's radio equipment is designed to meet these guidelines, Bulletin 10-F is necessary to codify these requirements within the industry.

Finally, we believe that having all paths prior coordinated will ease concerns about ATPC. The potential victims of interference from ATPC systems will have the opportunity to review the prior coordination notices and ensure that the 10-F guidelines are followed and that their systems are properly protected. The burden of ensuring that the 10-F guidelines are met is on the party sending the prior coordination notice while the party receiving the notice simply reviews it. Any questions can then be answered before applications are filed.

EIRP Reduction for Short Paths

In Section 101.143 the EIRP limitation for short paths is determined by the following equation:

$$\text{EIRP} = 30 - 20 \cdot \log(A/B) \text{ dBW}$$

where

EIRP = Equivalent Isotropically Radiated Power
A = Minimum Path Length for the Band
B = Actual Path Length (Less than Minimum)

The purpose for the equation is to promote spectrum efficiency by limiting the power available on short paths to that necessary to

achieve reliable communications, preserving the lower frequency bands for use on longer paths, and encouraging use of the higher frequency bands whenever possible.

In their comments, AT&T states that the above limitation is too restrictive since the downward jump in allowable EIRP at 17 km (for 6 GHz) from 55 to 30 dBW will result in unacceptable reliability for paths just under 17 km.² In some cases, a higher frequency band would not provide increased reliability, and the user would be left with no alternative to meet reliability requirements. AT&T recommends the following revised formula:

$$\text{EIRP} = \text{MAXEIRP} - 20 \cdot \log(A/B) \text{ dBW}$$

This formula eliminates the jump discontinuity in EIRP at the minimum path length of the band.

The TIA/NSMA comments, which Comsearch supported, included another proposal for the EIRP reduction formula:

$$\text{EIRP} = \text{MAXEIRP} - 10 - 20 \cdot \log(A/B) \text{ dBW}^3$$

Like the AT&T proposal, this proposal was aimed at reducing reliability problems on paths just under the minimum path length. It reduces the size of the downward EIRP jump at the minimum path length from 25 to 10 dB. At the same time, the TIA/NSMA formula includes the 10 dB downward jump as an attempt to satisfy the Commission's spectrum efficiency concerns.

² AT&T at 6 and 7.

³ NSMA/TIA at A-77.

Upon further review, we agree with AT&T regarding the necessity of eliminating the discontinuity in allowable EIRP, especially for wide band radios which have higher thresholds and therefore require higher EIRP for reliable operation. However, we believe that neither the AT&T proposal nor the TIA/NSMA proposal is restrictive enough on very short paths to encourage efficient use of the spectrum. Often, the path EIRP will be limited by the maximum receive level requirement of the receiver before it is limited by the AT&T equation. In nearly all cases, a more than adequate receive level is available without approaching the limitation of the AT&T equation. The TIA/NSMA formula shares these shortcomings, although to a lesser degree.

The free space pathloss has a second power dependence on path length while atmospheric multipath is conventionally modelled as having a third power dependence on path length. Therefore, the required EIRP for a given reliability objective has a fifth power dependence on path length. In other words, the required EIRP decreases with a $50 \cdot \log(A/B)$ slope with decreasing path length. For very short paths, the third power dependence of multipath outage on path length may no longer hold, but we believe that EIRP could safely be decreased with a $40 \cdot \log(A/B)$ slope. Therefore, we recommend eliminating the jump discontinuity in allowable EIRP but increasing the slope of the reduction:

$$\text{EIRP} = \text{MAXEIRP} - 40 \cdot \log(A/B) \quad \text{dBW}$$

This equation fulfills the AT&T and TIA/NSMA goals of allowing

reliable paths at lengths just under the minimum while more severely limiting the EIRP for very short paths. We believe that this proposal satisfies concerns regarding the abrupt break point while also accomplishing the Commission's goal of promoting spectrum efficiency. Please see attachments 1 and 2 for a comparison of the various proposals.

Applications

Comsearch agrees with the commenters who support the use of a single simplified application form.⁴ As stated in our initial comments, we view the consolidation of the Part 21 (Form 494) and Part 94 (Form 402) as a vital component in streamlining the application and licensing process. We further agree with the UTC's comments that any unique application requirements between the services can be handled on one form by specifying which questions pertain to each service. We wholeheartedly support the TIA/NSMA proposal that the Commission participate with industry to develop the format for a single application form and its electronic counterpart.⁵

⁴ Pacific Bell at 4; WMC at 2; SBC at 4; UTC at 4; GTE at 4; Southern Company at 11; TIA/NSMA at 12.

⁵ Several commenters support the use of electronic filing. DMC at 4 and TIA/NSMA at 12. Others support voluntary use of electronic filing. See comments of Pepper and Corazzini; Locate at 4; and RCCMC at 5. Comsearch supports the implementation of a voluntary electronic filing system.

Frequency Coordination

Comsearch concurs with the majority of the commenters who support the application of Part 21 frequency coordination procedures to both OF and CC applicants. These procedures have been proven over time to be highly effective at identifying and resolving interference issues without taxing valuable Commission resources. Comsearch disagrees with comments filed by a few parties that suggest Part 101.103 be modified to include holders of blanket licenses and temporary fixed authorizations as designated recipients of frequency coordination data.⁶

The FCC previously has rejected requests that would transform the prior coordination process into a unlimited one-way data exchange. As the FCC has stated, the prior coordination process is a private and limited matter that does not entitle prospective or temporary users of spectrum to direct involvement in the coordination process:

As a matter of policy, the Commission should not recognize interference protection claims of parties who are not applicants. First, the prior coordination process is designed to ensure greater efficiency in use of the spectrum. Requiring a carrier to prior coordinate with those who have previously coordinated but not filed an application could result in less efficient use of the spectrum as carriers would be coordinating with proposals that may never be implemented, and that, in fact, may be speculative. Second, the suggestion is not practical.

⁶ See comments of BellSouth, SBC Communications, Inc, and AT&T.

Prior coordination is essentially a private matter that occurs without direct Commission involvement Accordingly, we will continue to require applicants to prior coordinate only with existing users in an area and other applicants having previously-filed applications in order to be found acceptable for filing.⁷

A user's claim that because it holds temporary fixed authorizations, that may or may not have operational facilities, now or ever, does not bring it within the class of users entitled to frequency coordination notices as previously defined by the FCC.

The argument given for this request is that data on systems under prior coordination is necessary to effectively implement a temporary fixed station. When the holder of a temporary fixed authorization seeks to construct a temporary facility, the current FCC's rules place the burden of prior coordination notice on the holder of the temporary fixed authorization, not prospective applicants.⁸ In addition, the particular coordination concern for a temporary fixed authorization holder seeking to erect a temporary facility is with existing facility licensees not prospective applicants that do not yet have operational facilities and are conducting prior coordination in anticipation of filing an application. The temporary nature of the facilities constructed under the temporary fixed authorization (which are limited to six months) makes consideration of proposed facilities as an

⁷ In the Matter of Revision of Part 21 of the Commission's Rules, CC Docket No. 86-128, Report and Order, 2 FCC Rcd. 5713, 5716 (1987).

⁸ 47 C.F.R. § 21.708(a)(7)

interference concern unnecessary. Any remote possibility of interference conflicts with systems under coordination that may become licensed and active during the temporary period will be identified during the required coordination process of the temporary system. That is the purpose of the coordination process. To the best of our knowledge there have not been any cases of interference with a TFA, as suggested, or offered in support of this request that would have been resolved by expanding and complicating the current Part 21 coordination process.

Requests for blanket receipt of prior coordination notices because the party is a *potential* user of the spectrum, would completely change the private coordination process we know today, which was solely established to deal with interference concerns of users *preparing to file applications*. Increasing the scope and complexity of the coordination process will have several repercussions in the industry. The time required for the coordination process will increase as well as the cost involved which will lead to its demise as an effective and efficient process of resolving interference conflicts before applications are filed. This will bring the problems of resolving these conflicts back before the FCC, whereas reducing the FCC's role was the original reason the FCC initiated the industry coordination process in the mid 1970's.

In addition, we believe unnecessary expansion of the coordination process would place a large burden upon the industry that has not been fully considered. For example, Bell South has proposed adding the following sentence to Section 101.103 (d)(1): "Complete coordination data also must be furnished to any licensee who has advised the applicant or its representative of a desire to receive coordination data."⁹ With thousands of microwave licensees operating under Part 21 and Part 94, this rule change could result in today's average PCN recipient list of between 30 to 50 users increasing to literally hundreds or thousands. The additional time and expense to administer PCN notification and response under these conditions would be overly burdensome and not in the public interest.

Including *potential* users in the process could not discriminate in its application to a few large carriers but would apply to any interested party. If the process was expanded to include coordination with all holders of temporary fixed authorizations, this would include all common carriers and at least 200 private microwave users authorized to implement temporary fixed licenses in their regions. Since there is no practical way to create and maintain an accurate list of all TFA holders that includes their varying conditions of authorization and interest, we must question the industry's ability to even implement this process fairly.

⁹ BellSouth at 7 and 8.

We believe the current Part 21 rules regarding prior coordination have been very effective at identifying and minimizing potential interference conflicts prior to FCC involvement. As evidenced by the lack of interference concerns raised with the Commission over the years, the current Part 21 coordination process works extremely well. Therefore, the modifications to Section 101.103 (d)(1) proposed by AT&T, SBC Communications, Inc, and BellSouth should not be implemented.

MAS Coordination

In the point-to-multipoint MAS band, Comsearch shares the UTC's concerns regarding coordination notice requirements, potential channel hoarding and possible abuse of the process to block other applicants from obtaining channels.¹⁰ The interference protection criteria, FCC application processing procedures and demand for spectrum makes this band different from point-to-point bands. If Part 21 type coordination procedures are to be implemented, the coordination industry will need to develop specific guidelines to address the peculiarities associated with this band.

Conclusion

Comsearch is pleased to see general consensus within the industry that the Commission's efforts to consolidate Part 21 and Part 94

¹⁰ UTC at 6 and 7.

are commendable and truly serve the public interest. This proceeding offers the perfect opportunity to revise, revamp and improve the Rules covering the two services. As an active participant in the formulation of the joint TIA/NSMA comments, Comsearch believes that the TIA/NSMA proposals offer the most comprehensive, logical, and equitable approach to consolidating the Part 21 and Part 94 Rules. With the exception of our revised minimum path length EIRP calculation proposed herein, we strongly urge the Commission to consider the TIA/NSMA proposals as a basis for going forward in this proceeding.

Respectfully Submitted,

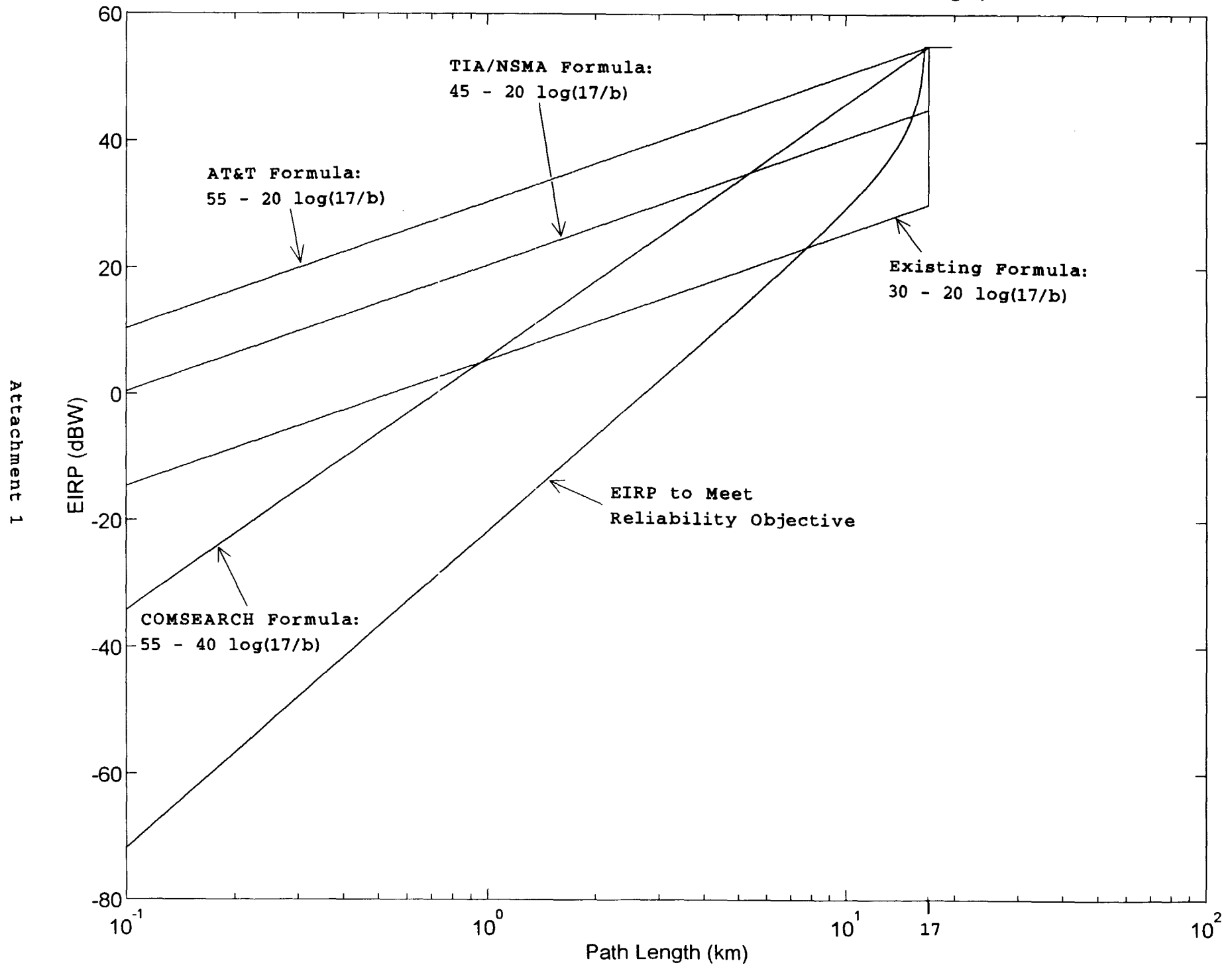
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Prepared by: _____

Christopher R. Hardy

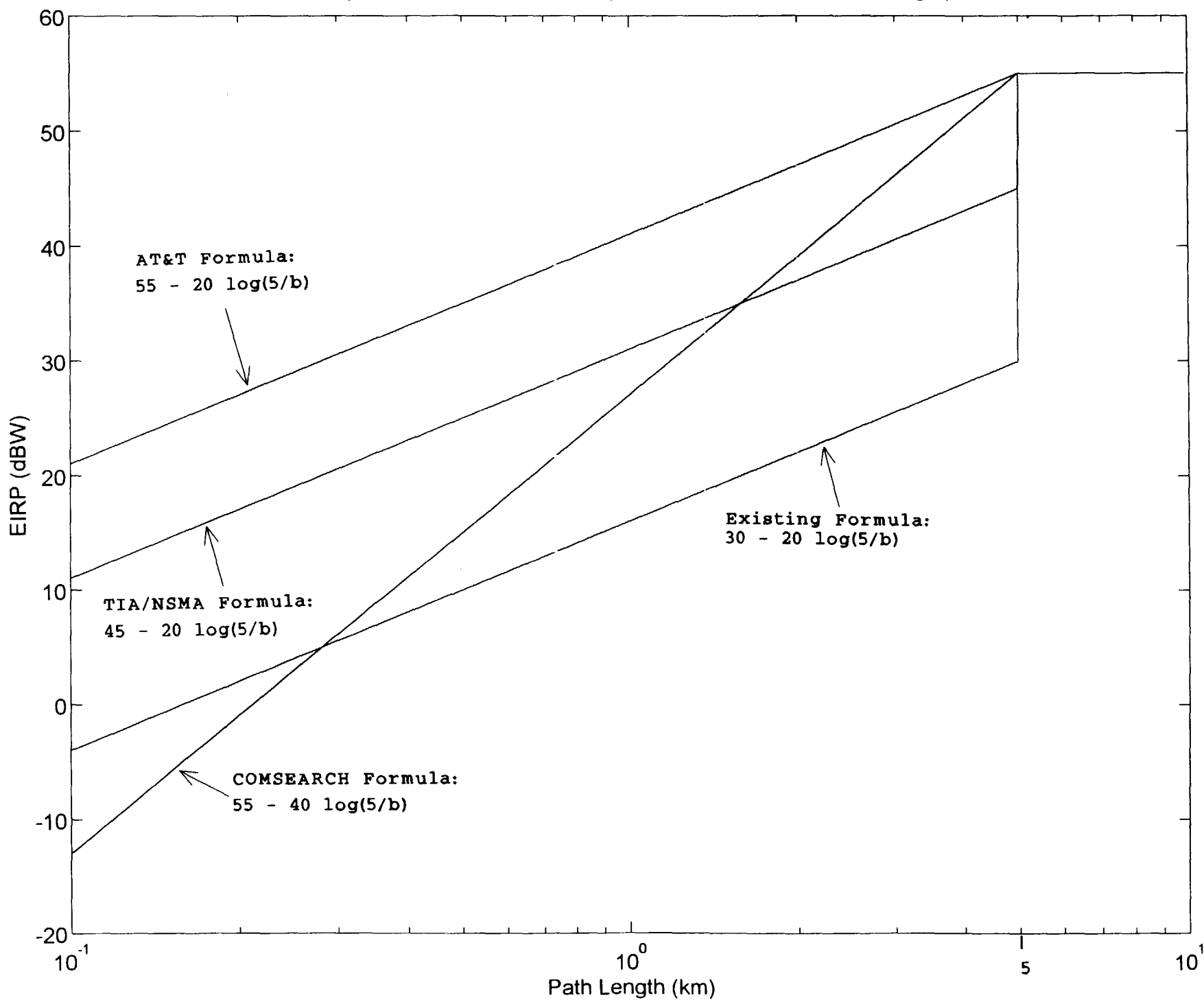
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Comparison of EIRP Formulas (Below 17 km Minimum Path Length)



Comparison of EIRP Formulas (Below 5 km Minimum Path Length)

Attachment 2



CERTIFICATE OF SERVICE

I, Meredith S. Workman, a secretary at Comsearch, do hereby certify that the attached Reply Comments were mailed on March 20, 1995, by first class mail, postage prepaid, to the following:

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